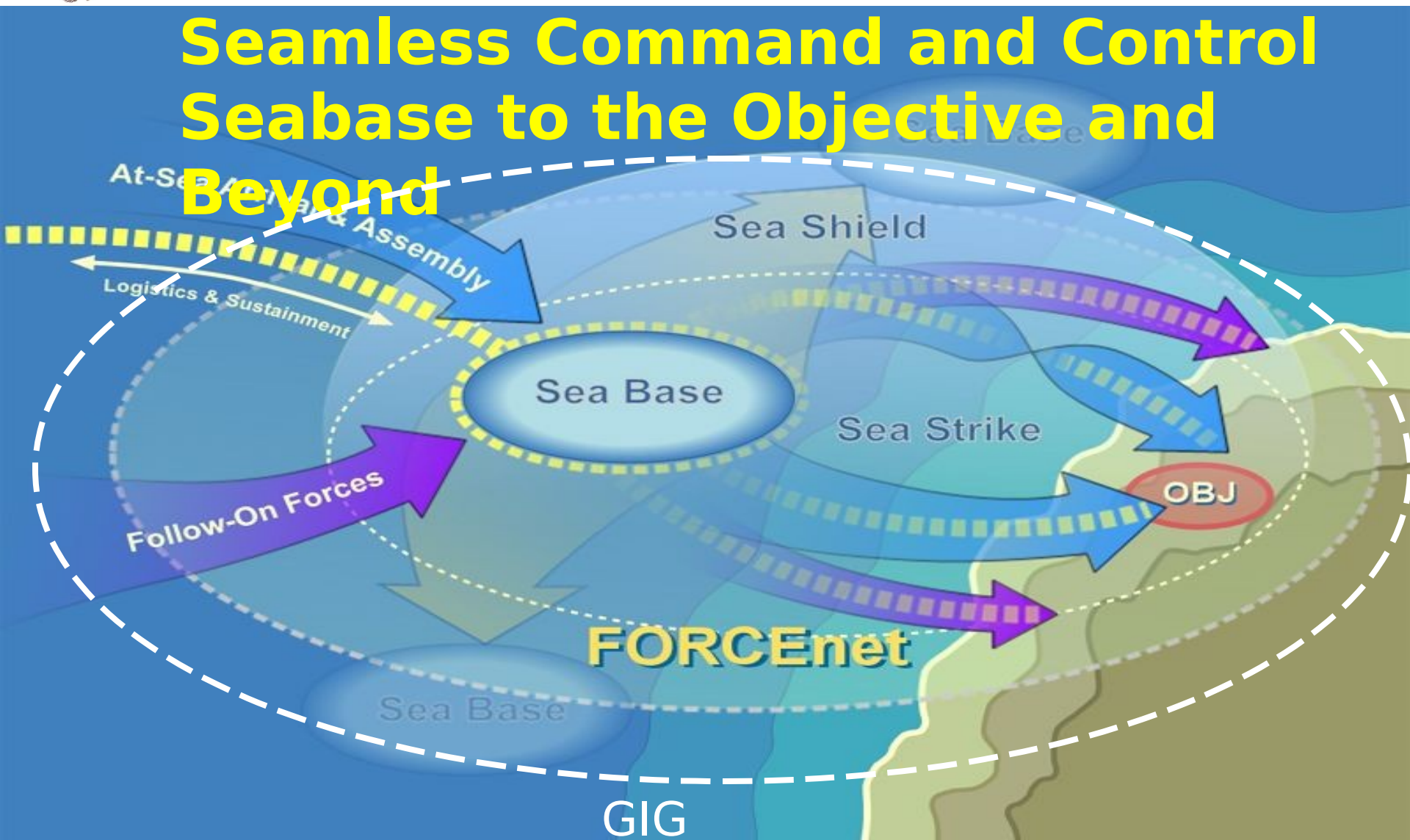
Architecture Based Analysis in
rine Corps Expeditionary Force Development

Expeditionary Maneuver Warfare

Seamless Command and Control Seabase to the Objective and Beyond



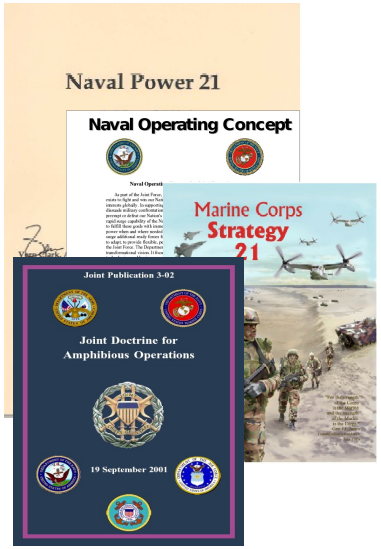
Network Architectures 1864 - 2004

- **Commander Centric**
  - Decision-making
  - Planning
  - Leadership
- **Network Enabled**
  - Commander's intent
  - Shared awareness
  - Decentralized operations
  - Tempo

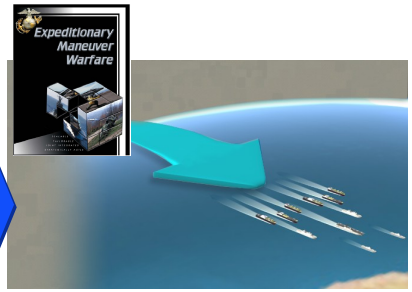
Network must be Adaptable to the Comman

Concept-Based Development

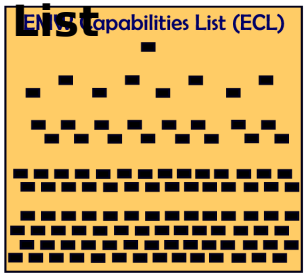
Guidance



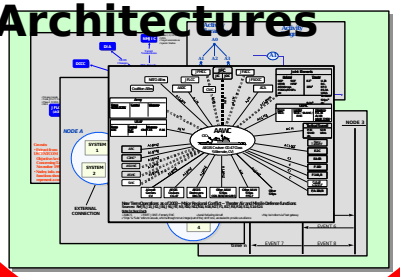
Concepts



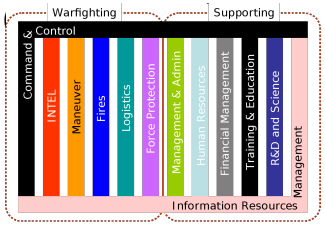
Capabilities List



Integrated Architectures



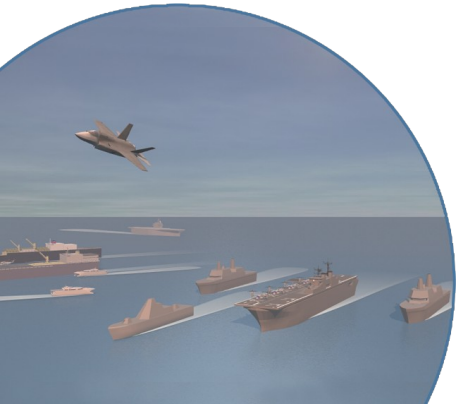
Macro Functional



Capabilities

Technology Insertion

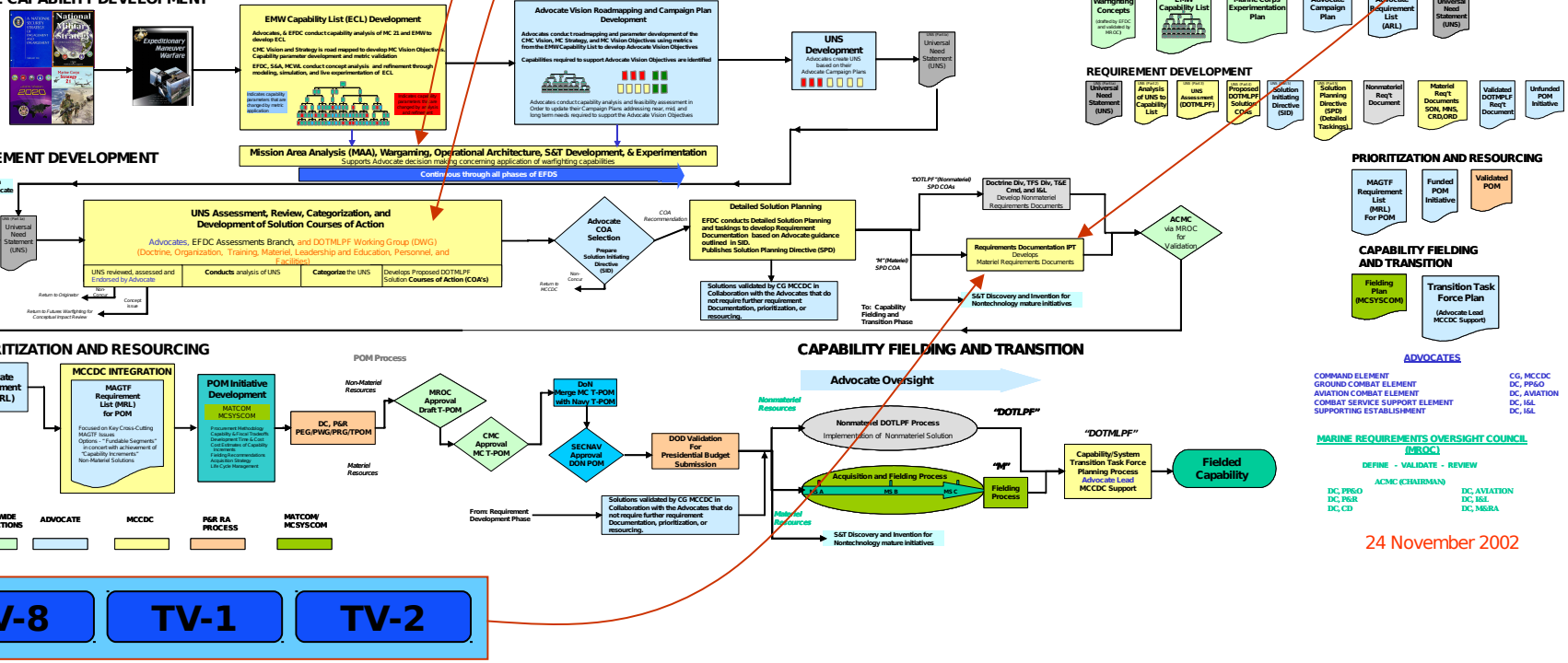
S&T Investment
Experimentation



Expeditionary Force Development System

OV-1 **OV-4*** **OV-5***

OV-2 **OV-4*** **SV-1** **SV-4**
OV-3 **OV-5*** **SV-3** **SV-5**


EXPEDITIONARY FORCE DEVELOPMENT SYSTEM (EFDS)
FORCE CAPABILITY DEVELOPMENT
EMW Capability List (ECL) Development
Advocates, & EFDC conduct capability analysis of MC 21 and EMW to develop ECL
CNC Vision and Strategy is road mapped to develop MC Vision Objectives. Capability parameter development and metric validation
EFDC, S&A, MCWL conduct concept analysis and refinement through modeling, simulation, and live experimentation of ECL
Advocate Vision Roadmapping and Campaign Plan Development
Advocates conduct roadmapping and parameter development of the CNC Vision, MC Strategy, and MC Vision Objectives using metrics from the EMW Capability List to develop Advocate Vision Objectives
Capabilities required to support Advocate Vision Objectives are identified
Advocates conduct capability analysis and feasibility assessment in Order to update their Campaign Plans addressing near, mid, and long term needs required to support the Advocate Vision Objectives
UNS Development
Advocates create UNS based on their Advocate Campaign Plans
Universal Need Statement (UNS)
Mission Area Analysis (MAA), Wargaming, Operational Architecture, S&T Development, & Experimentation
Supports Advocate decision making concerning application of warfighting capabilities
Continuous through all phases of EFDS
REQUIREMENT DEVELOPMENT
From Advocate
From Operating Forces or Supporting Establishment
Universal Need Statement (UNS)
UNS Assessment, Review, Categorization, and Development of Solution Courses of Action
Advocates, EFDC Assessments Branch, and DOTMLPF Working Group (DWG) (Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities)
UNS reviewed, assessed and Endorsed by Advocate
Conducts analysis of UNS
Categorize the UNS
Develops Proposed DOTMLPF Solution Courses of Action (COA's)
Return to Originator
Non-Concur
Concept is out
Return to Future Warfighting for Conceptual Impact Review
Advocate COA Selection
Prepare Solution Initiating Directive (SID)
Non-Concur
Return to MCCDC
COA Recommendation
Detailed Solution Planning
EFDC conducts Detailed Solution Planning and taskings to develop Requirement Documentation based on Advocate guidance outlined in SID.
Publishes Solution Planning Directive (SPD)
Solutions validated by CG MCCDC in Collaboration with the Advocates that do not require further requirement Documentation, prioritization, or resourcing.
"DOTLPF" (Nonmaterial) SPD COAs
"M" (Materiel) SPD COA
Doctrine Div, TFS Div, T&E Cmd, and I&L
Develop Nonmateriel Requirements Documents
Requirements Documentation IPT
Develops Materiel Requirements Documents
S&T Discovery and Invention for Nontechnology mature initiatives
To: Capability Fielding and Transition Phase
ACMC via MROC for Validation
PRIORITIZATION AND RESOURCING
Advocate Requirement List (ARL)
MCCDC INTEGRATION
MAGTF Requirement List (MRL) for POM
Focused on Key Cross-Cutting MAGTF Issues
Options - " Fundable Segments" in concert with achievement of "Capability Increments"
Non-Materiel Solutions
POM Initiative Development
MATCOM MCSYSCOM
Procurement Methodology
Capability &Force/ Tradeoffs
Development Time & Cost
Cost Estimates of Capability Options
Fielding Recommendations
Acquisition Strategy
Life Cycle Management
POM Process
DC, P&R PEG/PWG/PRG/TPOM
Non-Materiel Resources
Material Resources
MROC Approval Draft T-POM
CMC Approval MC T-POM
DoN Merge MC T-POM with Navy T-POM
SECNAV Approval DON POM
DOD Validation For Presidential Budget Submission
From: Requirement Development Phase
Solutions validated by CG MCCDC in Collaboration with the Advocates that do not require further requirement Documentation, prioritization, or resourcing.
CAPABILITY FIELDING AND TRANSITION
Advocate Oversight
Nonmateriel Resources
Nonmateriel DOTLPF Process
Implementation of Nonmateriel Solution
"DOTLPF"
"M"
Acquisition and Fielding Process
MS A
MS B
MS C
Fielding Process
Material Resources
S&T Discovery and Invention for Nontechnology mature initiatives
"DOTMLPF"
Capability/System Transition Task Force Planning Process
Advocate Lead MCCDC Support
Fielded Capability
MROC & MC WIDE PROCESS/ACTIONS
ADVOCATE
MCCDC
P&R RA PROCESS
MATCOM/ MCSYSCOM
FORCE CAPABILITY DEVELOPMENT
Warfighting Concepts
EMW Capability List
Marine Corps Experimentation Plan
Advocate Campaign Plan
Advocate Requirement List (ARL)
Universal Need Statement (UNS)
REQUIREMENT DEVELOPMENT
Universal Need Statement (UNS)
Analysis of UNS to Capability List
UNS Assessment (DOTMLPF)
Proposed DOTMLPF Solution COAs
Solution Initiating Directive (SID)
Solution Planning Directive (SPD) (Detailed Taskings)
Nonmateriel Req't Document
Materiel Req't Documents SON, MNS, CRD,ORD
Validated DOTMPLF Req't Document
Unfunded POM Initiative
PRIORITIZATION AND RESOURCING
MAGTF Requirement List (MRL) For POM
Funded POM Initiative
Validated POM
CAPABILITY FIELDING AND TRANSITION
Fielding Plan (MCSYSCOM)
Transition Task Force Plan
(Advocate Lead MCCDC Support)
ADVOCATES
COMMAND ELEMENT
GROUND COMBAT ELEMENT
AVIATION COMBAT ELEMENT
COMBAT SERVICE SUPPORT ELEMENT
SUPPORTING ESTABLISHMENT
CG, MCCDC
DC, PP&O
DC, AVIATION
DC, I&L
DC, I&L
MARINE REQUIREMENTS OVERSIGHT COUNCIL (MROC)
DEFINE - VALIDATE - REVIEW
ACMC (CHAIRMAN)
DC, PP&O
DC, P&R
DC, CD
DC, AVIATION
DC, I&L
DC, M&RA
24 November 2002

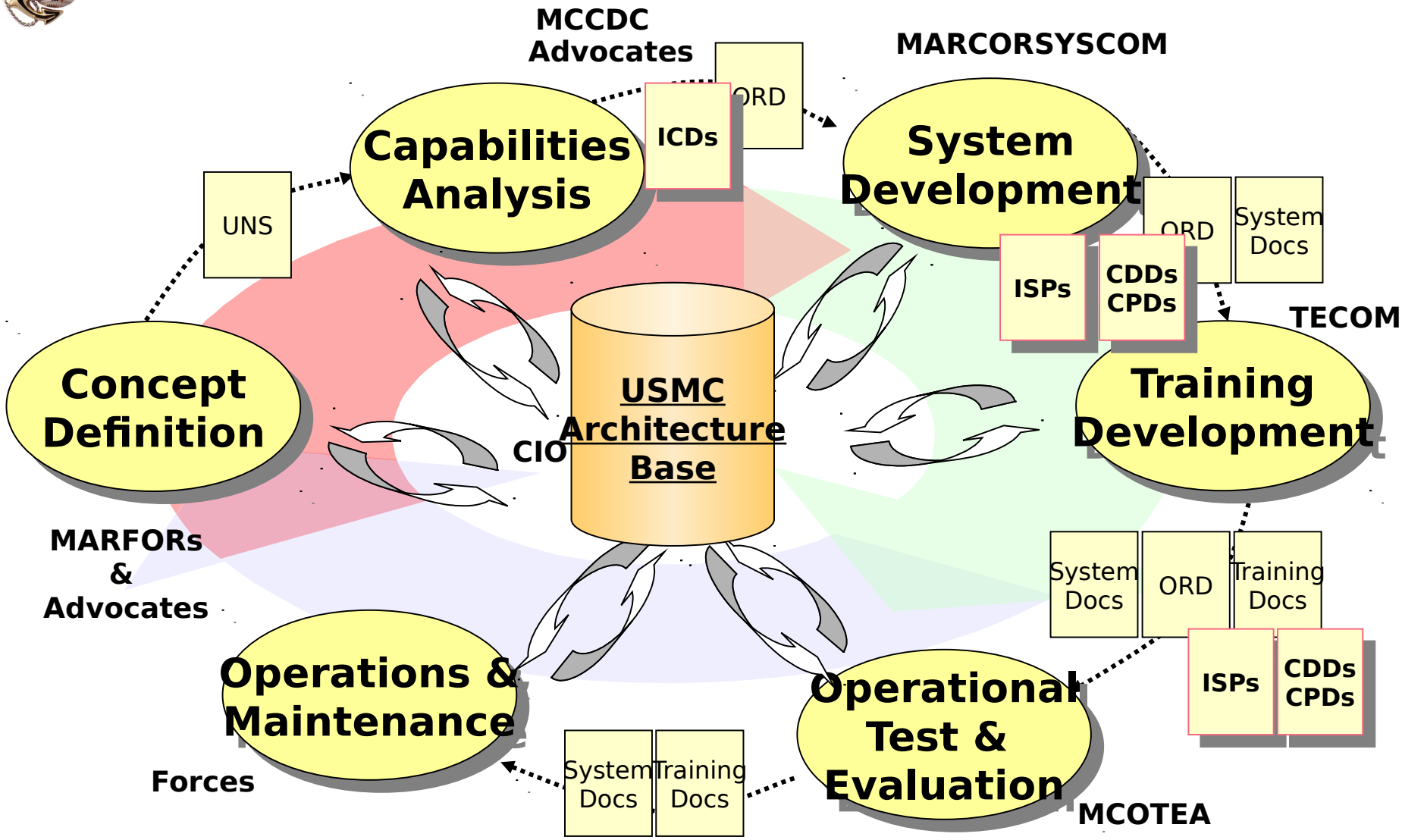
SV-8 **TV-1** **TV-2**

OV-1 High Level Operational Concept Graphi
OV-2 Operational Node Connectivity Descript
OV-3 Operational Information Exchange Matr
OV-4 Organizational Relationships Chart
OV-5 Operational Activity Model
OV-6c Operational Event-Trace Description

SV-1 Systems Interface Description
SV-3 Systems-Systems Matrix
SV-4 Systems Functionality Description
SV-5 Operational Activity to Systems Function Traceability Matrix
SV-6 Systems Data Exchange Matrix
SV-8 Systems Evolution Description

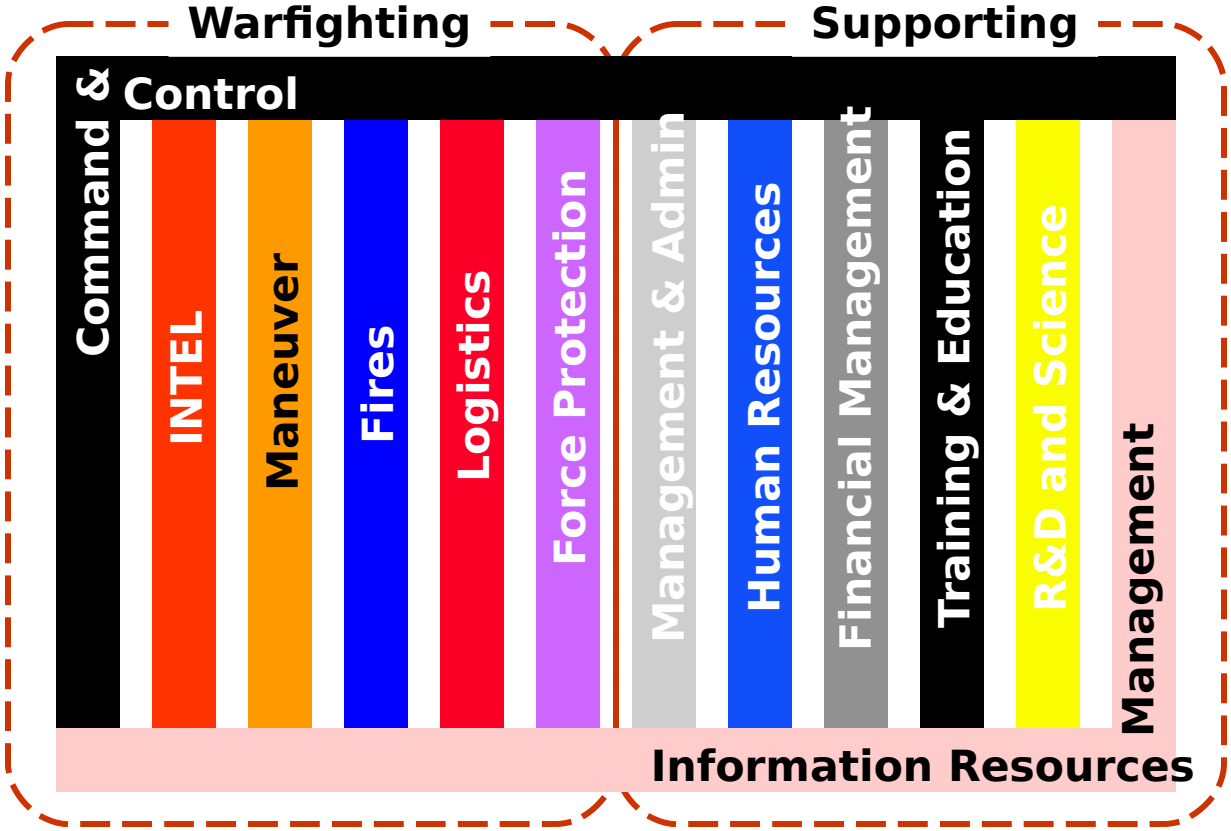
Technical Standards Profile
Technical Standards Forecast

Application of Architectu



Macro Functional Orientation

- Command & Control
- Maneuver
- Fires
- Intelligence
- Logistics
- Force Protection
- Management & Administration
- Human Resources
- Financial Management
- Training & Education
- R&D and Science
- Information Resources Management



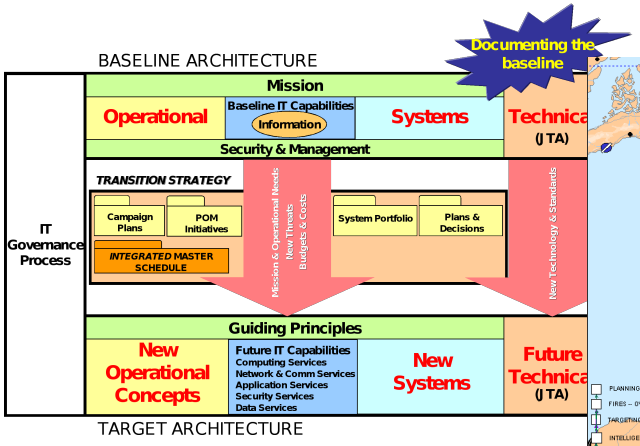
- Warfighting functional areas**: Aids the commander in achieving unity of effort and building and sustaining combat power. Mutually supporting military activities integrated in the conduct of all military operations. [MCDP 1-0, Marine Corps Operations]**
- Supporting functional areas**: Assists the commander in preparing and sustaining forces for operational employment. Mutually supporting activities integrated for the readiness and sustainment of military forces.**

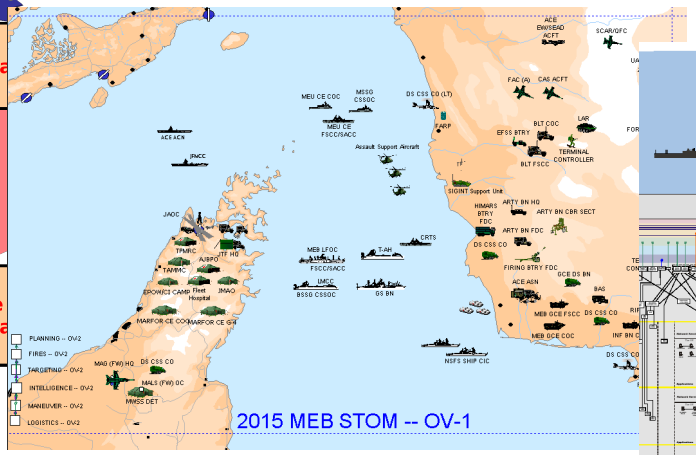
USMC Architecture Agencies

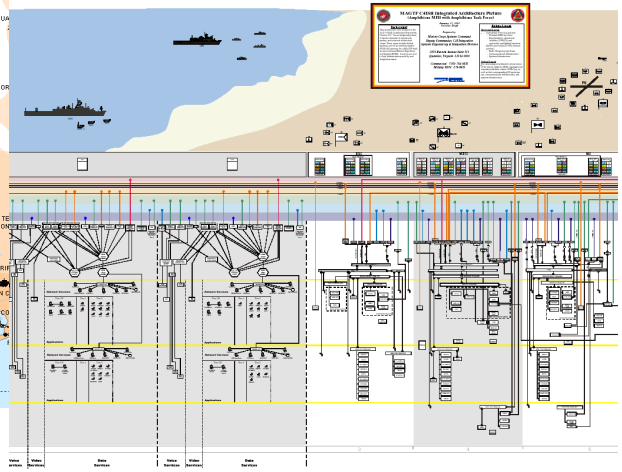
- Process and agency coordination

- Operational views

- Systems and technical views
- Architecture engineering infrastructure

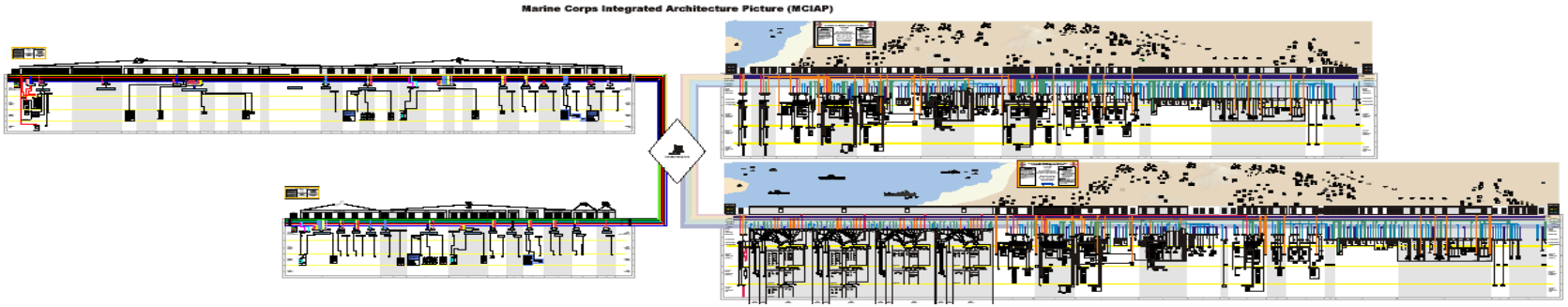




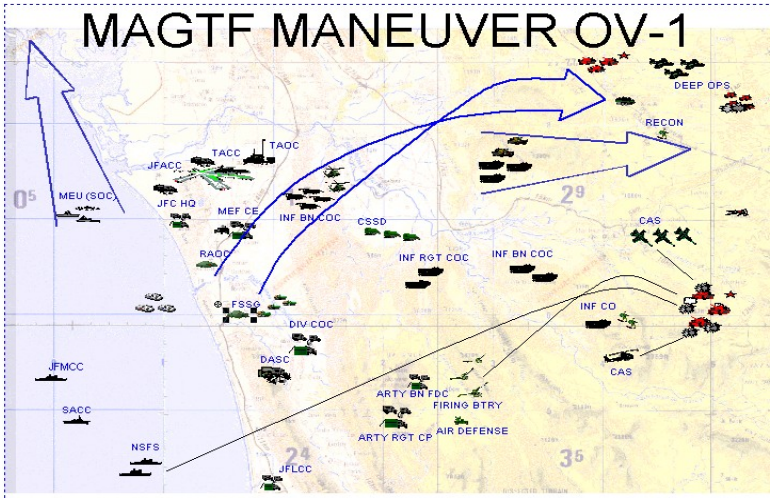


Concept of Employment

- Establish a repository for “re-usable” data
- Input is validated and constitutes the starting point for all architectural analysis
  -Marine Corps Architecture Support Environment (MCASE) ORACLE
- Not tool specific (NetViz, Bonaparte, Popkin, etc.)
- Marine Corps Integrated Architecture Picture (MCIAP) is the



Architectures in Practice



Concept Development

Expeditionary Force Development System

Future Requirements

JCIDS

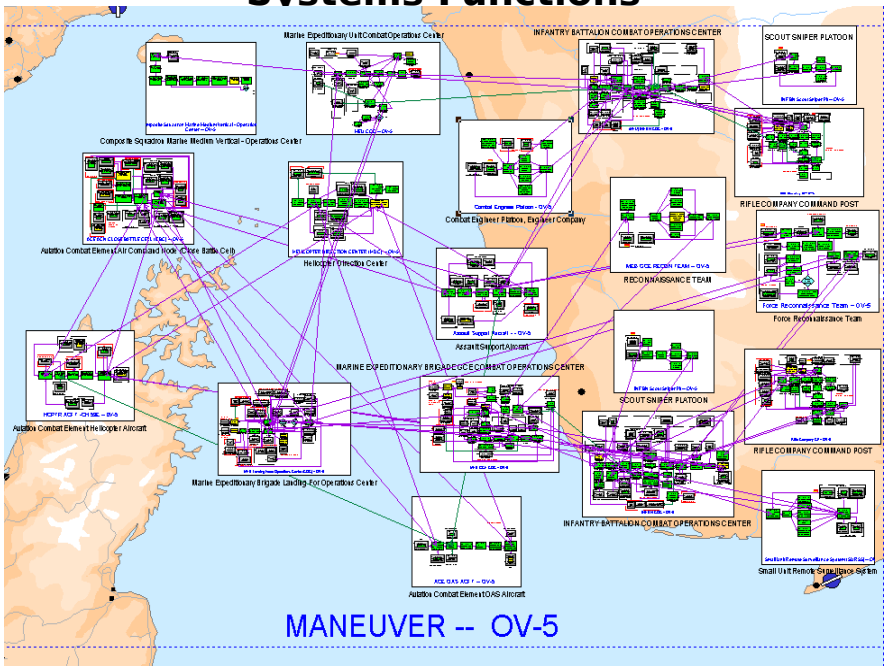
JBMC2

FORCEnet

Cross Functional Analysis

Synchronizing C2 Initiatives

Systems Functions


Marine Expeditionary Unit Combat Operations Center
INFANTRY BATTALION COMBAT OPERATIONS CENTER
SCOUT SNIPER PLATOON
Composite Squadron Marine Medium Vertical - Operations Center
RIFLE COMPANY COMMAND POST
Combat Engineer Platoon, Engineer Company
Aviation Combat Element Air Combined Node (Close Battle Cell)
Helicopter Direction Center
RECONNAISSANCE TEAM
Force Reconnaissance Team
Aircraft Support Aircraft
MARINE EXPEDITIONARY BRIGADE/GCE COMBAT OPERATIONS CENTER
SCOUT SNIPER PLATOON
Aviation Combat Element Helicopter Aircraft
Marine Expeditionary Brigade Landing Force Operations Center
RIFLE COMPANY COMMAND POST
INFANTRY BATTALION COMBAT OPERATIONS CENTER
Small Unit Remote Surveillance System
Aviation Combat Element OAS Aircraft
MANEUVER -- OV-5

Joint Battle Management C2

Joint Mission Threads

Joint Close Air Support (JCAS)

Time Sensitive Target (TST) Attack

Joint Ground Maneuver (JGM)

Joint Command and Control (JC2)

Integrated Air and Missile Defense

Joint Integrated Fires

Focused Logistics.

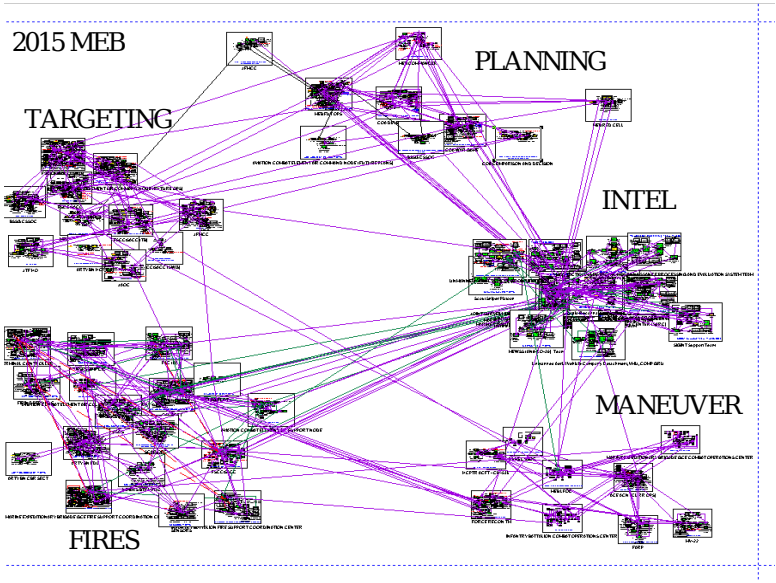
Pathfinder Programs

C2PC

TCO

DCGS

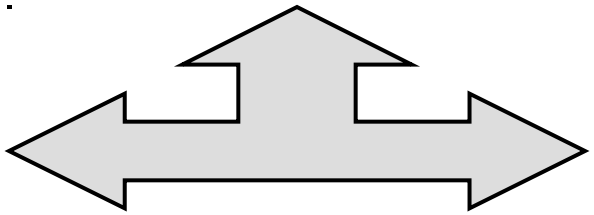
C2 Architectures



C2 architecture provides “horizontal” integ

Command and Control Perspective

Decision Making



Command:
Intent:
- Purpose
- Method
- End state

Concept
Mission
Etc.

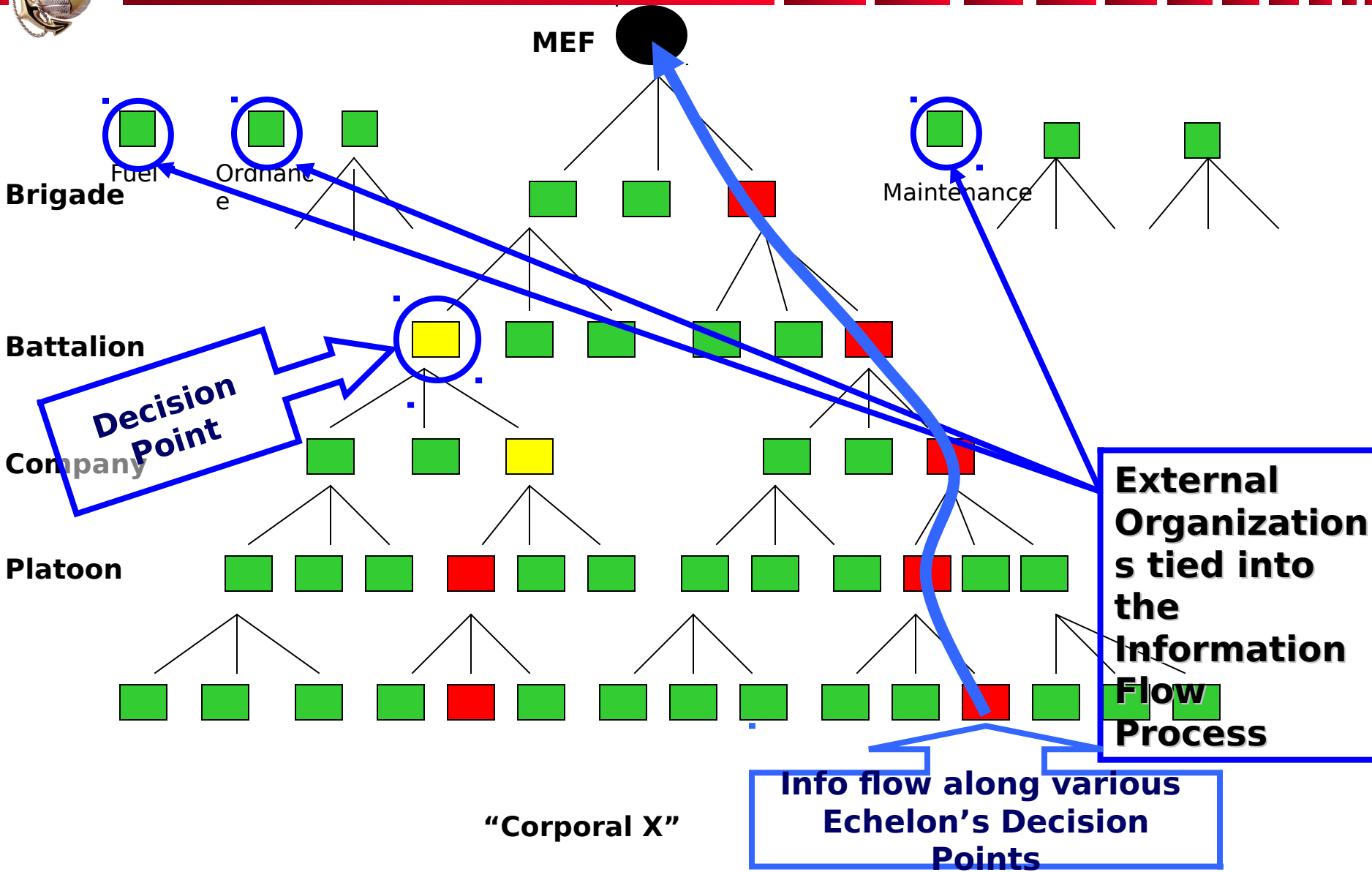
Initiation of action

MCDP 6 Command and Control: C2 as reciprocal influence- command as initiation of action and control as feedback

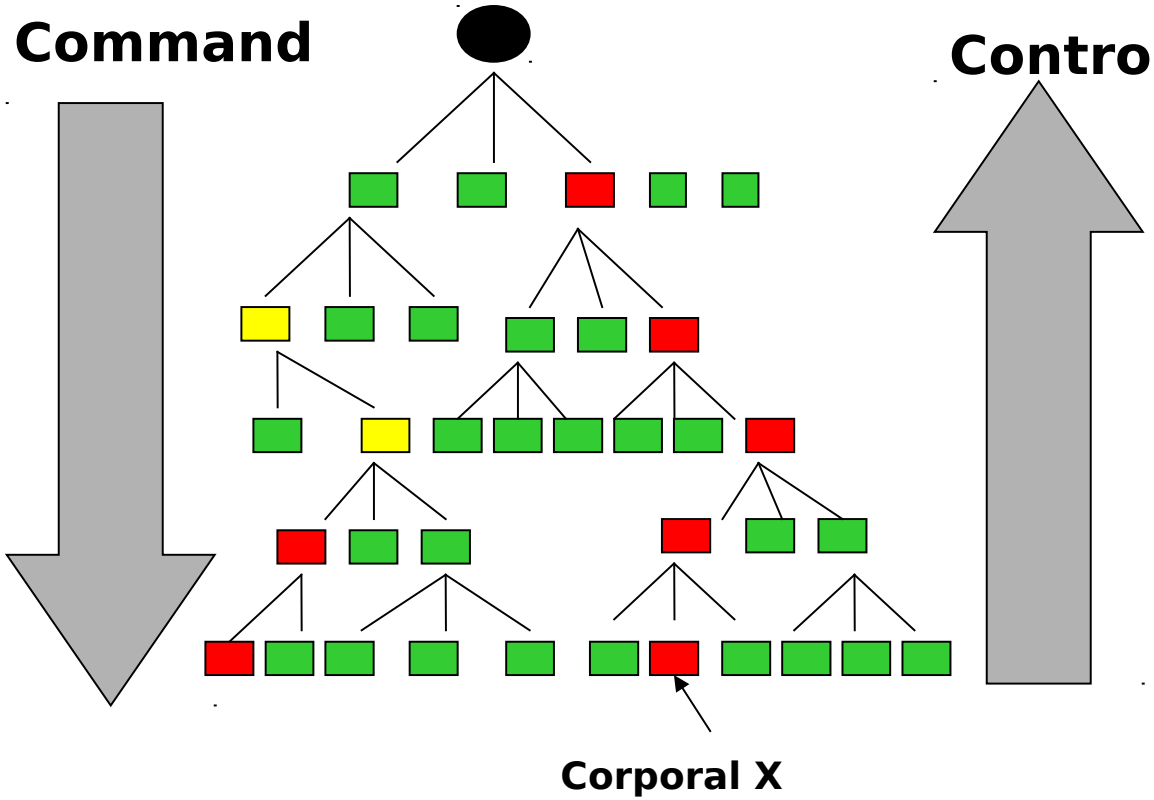
Control:
Fires
Maneuver
Logistics
Assessment
Personnel
Intelligence
Etc.

Feedback

Commander's Critical Information Requirements (CCIRs)

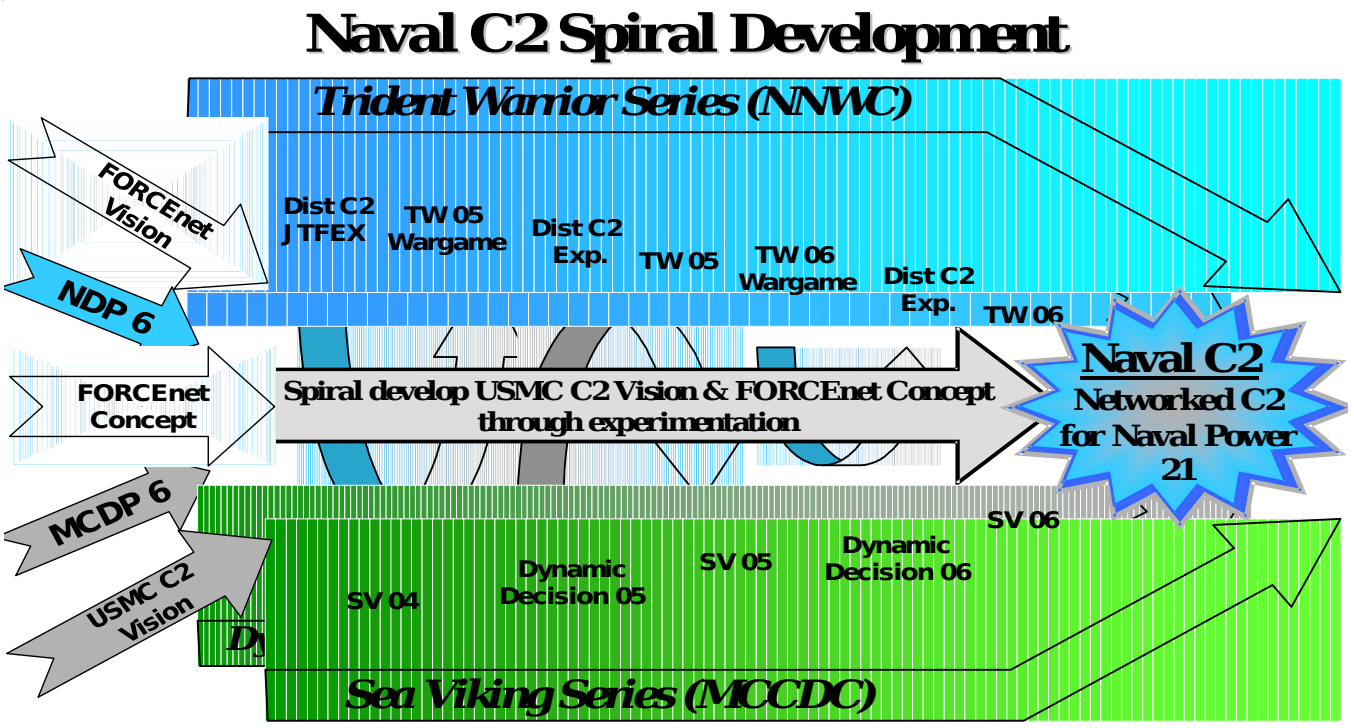


CCIR Analytical Framework



- Decision making information works from the bottom up as Decision Points
- This System is designed to increase Situational Awareness and Expedite Higher HQ Influence or Intervention If or When Required
- This is not a System of Micromanagement

Naval C2 FORCEnet



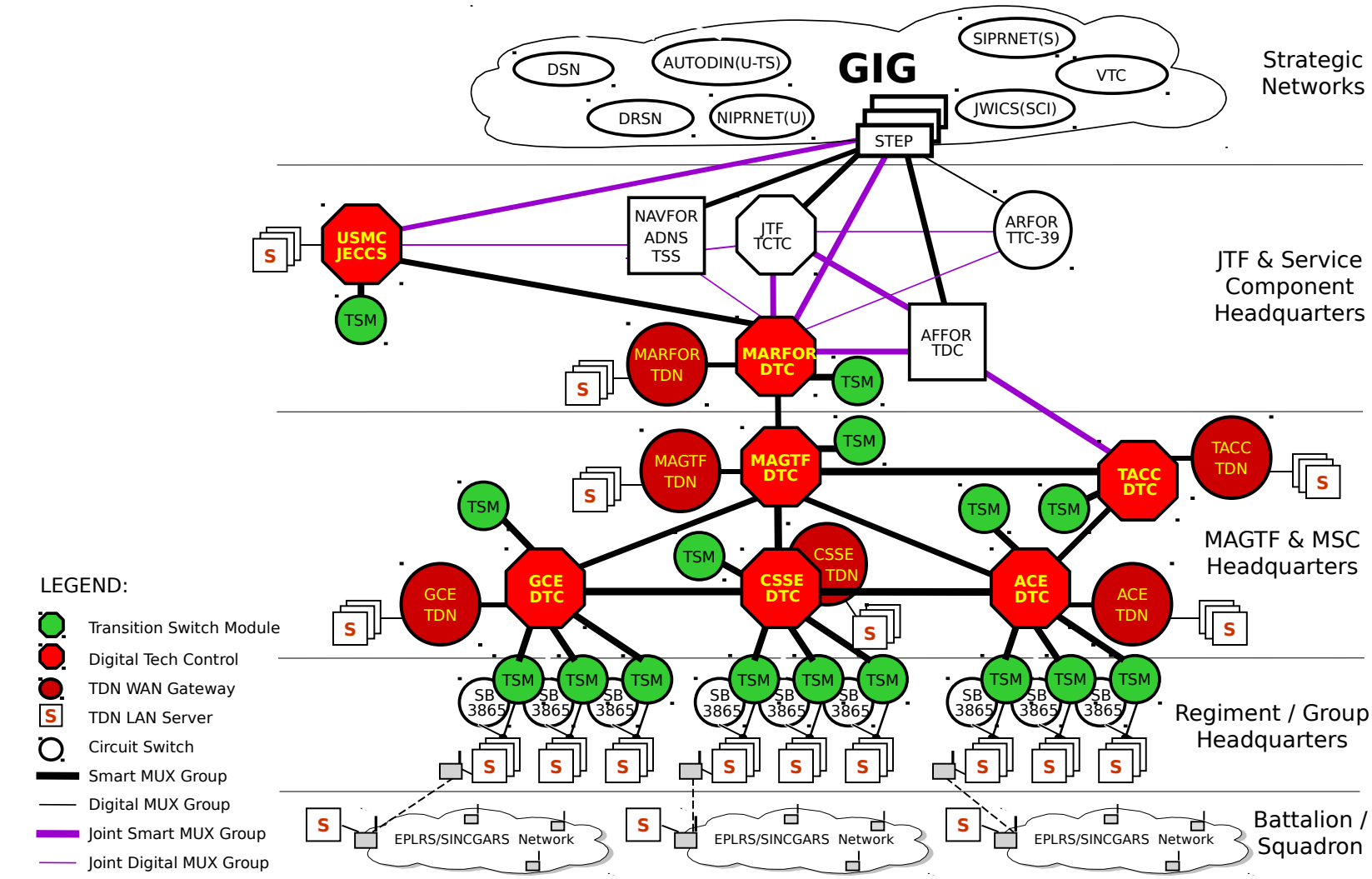
JBMC2 Core Capability

Synchronized Spirals

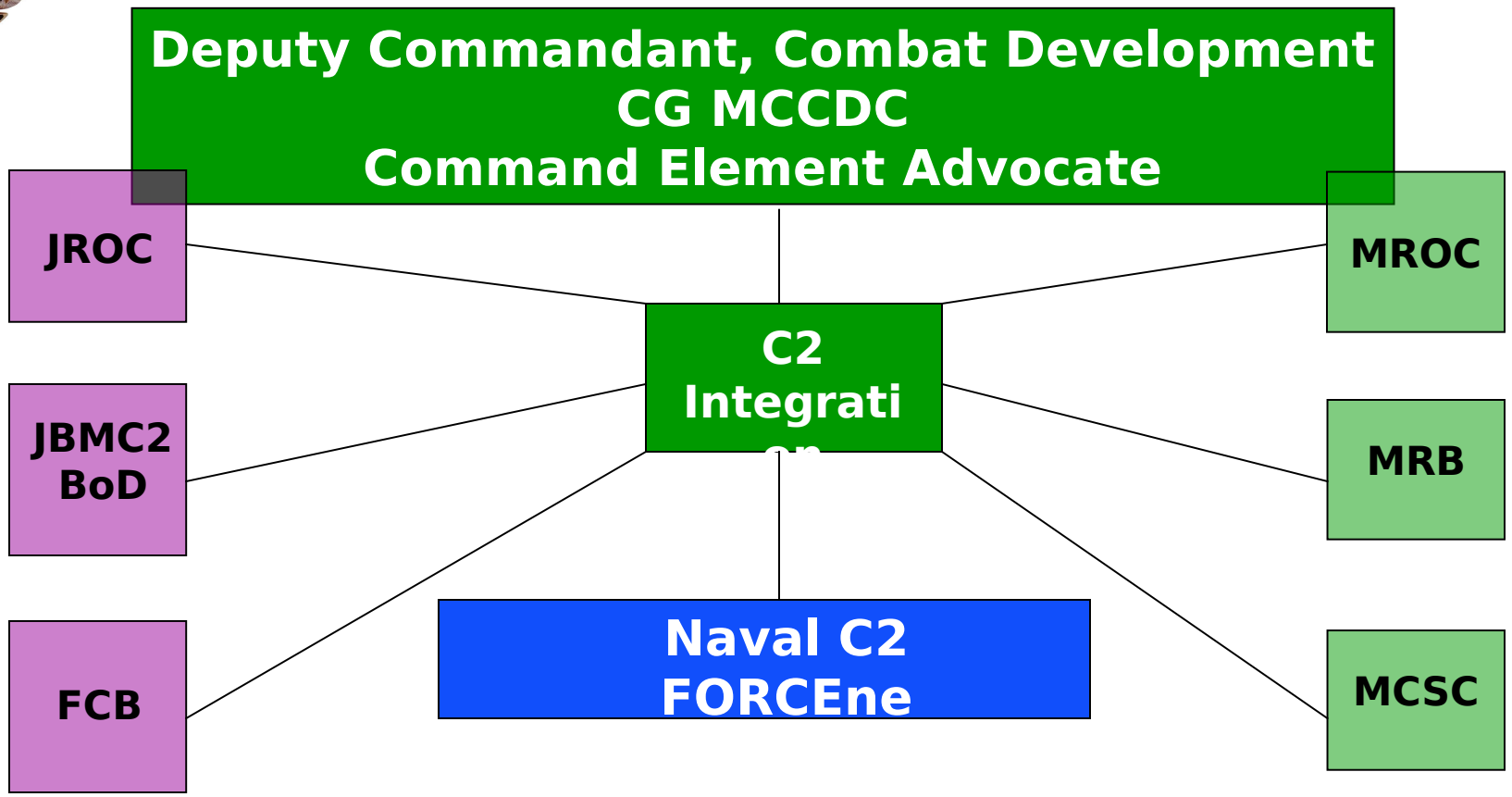
- Influence concept development
- Document FORCEnet requirements
- Co-evolve Naval OV development
- Validate baseline Operational Views

Architecture based, Commander Focused, System E

Operational System Overview



Joint and Multi-Service C2 Integration



Operational Architecture Focal Point

Summary

CMC
(enterprise)

Small Unit

Command & Control

Info Resources Mgt

Decision-Maker

INTEL

Mgt & Admin

Maneuver

HR

War

Peace

FIRES

Finance

LOG

Train & Edu

Force Protect

R&D Science

he Marine's (architecture process) is now the model for USFK components…"

MGEN Higgins, CFC C/J-3

"…the Marine's architecture work in the First Responder
Network effort… helped develop a reliable and effective
system of command and control…"

Jerry Oster, Coalition Provisional Authority, Iraq